XXXVII

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CLASSIFICATION CHANGED TO [redacted]
By Authority of
AFR 205-2
8 APR 1966

WG001
140400Z
M 6595 AEROSPACE TEST WG VANDENBERG AFB CALIF
O SSD LOSA CALIF
594 AEROSPACE TEST WG SUNNYVALE CALIF
MSC SUNNYVALE CALIF
EN/LMSC VANDENBERG AFB CALIF
EN/DOUGLAS ACFT CO VANDENBERG AFB CALIF
NFO ZEN/1STRATAD VANDENBERG AFB CALIF
555 AEROSPACE TEST WING PATRICK AFB FLA
LC WRIGHT PATTERSON AFB OHIO
AMA NORTON AFB CALIF
DET 1 AFLC VANDENBERG AFB CALIF
Z/CSD 1 WCMR VANDENBERG AFB CALIF

~~E C R E T~~/FROM VWZD-1[illegible]-1-[illegible]-S. SECTION I OF II.
ESTO FLAS. SSD FOR SSZD SEMCLN 6594TW
R COL MOORE SEMCLN LMSC/SUNNYVALE FOR TWRCA-3 /H.J. DREIFUSS/
EMCLN LMSC/VAFB FOR DEP 65-44 SEMCLN DAC/VAFB FOR MR HECKMAN. INFO
LN 1STRATAEROSPACEDIV FOR COMMAND POST AND WDOPO SEMCLN AFLCSG/VAFB
OR MR YOUNG SEMCLN 6555TW FOR COL WIGNALL SEMCLN SBAMA/NORTON AFB
OR SBVP SEMCLN AFLC/WRIGHT PATTERSON AFB FOR MCGO. SUBJECT CLN
LASH REPORT ON THE LAUNCHING OF DISCOVERER 37.
. DISCOVERER 37 CONSISTING OF THOR BOOSTER NO. 327 AND AGENA B ORBITAL
TAGE NO. 1120 WAS LAUNCHED FROM VAFB COMPLEX 75-3 PAD 4 AT 1341:02.5
ST ON 13 JANUARY 1962. THE PRIMARY LAUNCH OBJECTIVE, TO PLACE THE

GE TWO VAFB
SCOVERER SATELLITE WITH PAYLOAD IN A NEAR POLAR ORBIT, WAS NOT
COMPLISHED. FAILURE TO ATTAIN ORBIT RESULTED FROM AN INTERRUPTION
POWER TO THE IRP GYRO WHEELS AT THE TIME OF SEPARATION. THIS LOSS
GYRO WHEEL EXCITATION DID NOT PERMIT NORMAL ATTITUDE CONTROL TO
EXERCISED FOLLOWING AGENA IGNITION. AFTER IGNITION VIOLENT TUMBLING
CURRED AND RESULTED IN A PREMATURE SHUTDOWN AFTER ONLY APPROXIMATELY
SEC OF THRUST. THE OCCURRENCE OF AN ELECTRICAL SHORT DURING
PARATION IS STRONGLY INDICATED BY A COMPLETE LOSS OF LINK 2 TELEMETRY
GNAL, A 0.1 SEC DROUPOUT IN LINK 1 TELEMETRY, THE BEHAVIOR OF THE
NTINUOUS MEASUREMENTS, AND THE AUXILIARY POWER SYSTEM VOLTAGE TRAN-
ENTS. 2. PRELIMINARY EVALUATION INDICATES THAT LAUNCH TEST OBJECTIVES
RE ACHIEVED AS FOLLOWS.. /REF. DETAILED TEST OBJECTIVES, LMSD 446404,
CTION 2/.
DISCOVERER BOOSTER - OBJECTIVE ACHIEVED
BOOSTER CUTOFF VEHICLE POSITION WAS WITHIN A SPHERE OF 5 NM RADIUS,
IGHT PATH ANGLE WAS WITH PLUS OR MINUS 4 DEG, AND VELOCITY WAS WITHIN
FPS OF THE NOMINAL VALUE. BOOSTER STEERING AND EVENT COMMANDS WERE
ERATED AND TRANSMITTED SATISFACTORILY BY THE GROUND FUIDANCE SYSTEM
VEHICLE RESPONSE TO THE COMMANDS APPEARS TO HAVE BEEN PROPER.
O OCCURRED AT T PLUS 144.2 SEC AS A RESULT OF COMMAND FROM GROUND
DANCE SYSTEM. VERNIER ENGINE SOLO OPERATION LASTED 8.9 SEC WITH
O OCCURRING AT T PLUS 153.1 SEC. SEPARATION WAS INITIATED BY A
UND GUIDANCE COMMAND AT T PLUS 158.8SEC. GROUND GUIDANCE SYSTEM DATA

INDICATE THE BOOSTER COAST APOGEE ALTITUDE WAS 108.2 NM /NOMINAL:108.3NM/ AND THE BOOSTER COAST APOGEE VELOCITY WAS 9750 FPS /NOMINAS: 9,756 PS/.

B. AGENA AIRFRAME AND ADAPTER - OBJECTIVE ACHIEVED
NO EVIDENCE OF STRUCTURAL PROBLEMS IN AGENA AIRFRAME OR ADAPTER HAS BEEN NOTED, ALTHOUGH ABNORMAL LOADS WERE APPLIED DUE TO TUMBLING OF THE VEHICLE AFTER AGENA IGNITION. THE RETRO-ROCKET SATISFACTORILY PROVIDED THE THRUST NECESSARY FOR SEPARATION BY T PLUS 161.15 SEC. DURATION OF THE SPEARATION PROCESS WAS NORMAL.

C. AGENA PROPULSION SYSTEM - OBJECTIVE NOT ACHIEVED
AGENA ENGINE IGNITION OCCURRED IN A NORMAL MANNER AT T PLUS 193.32 SEC AND THE ENGINE OPERATED SATISFACTORILY FOR 10.58 SEC. PREMATURE ENGINE SHUTDOWN OCCURRED AT T PLUS 203.90 SEC AND RESULTED FROM VEHICLE TUMBLING. THE ENGINE OPERATED WITHOUT THRUST VECTOR CONTROL AND BEGAN TO ROTATE ABOUT THE PITCH AND YAW AXES AS SOON AS THRUST ATTAINMENT WAS REACHED.

D. AGENA ELECTRICAL POWER SYSTEM - OBJECTIVE PARTIALLY ACHIEVED
THE AGENA ELECTRICAL POWER SUPPLY SUBSYSTEM PERFORMANCE WAS NORMAL UP TO THE START OF SPEARATION. AT THIS TIME THERE WAS A 0,1 SEC
~~TELEMETRY DROUPOUT ON ALL CHANNELS.~~ RECOLG
SET ME 02 IMI 02K

DE NAFB GA
DE SSB KC

TELEMETRY DROUPOUT ON ALL CHANNELS. RECOVERY FROM THE DROUPOUT OCCURRED AT T PLUS 158.98 SEC, AT WHICH TIME THE IRP PHASE-AB VOLTAGE FUSE

MONITOR REOORDED A DROUP IN LEVEL. IT THEREAFTER REMAINED AT APPROXIMATELY HALF ITS NORMAL VALUE AND IS BELIEVED TO BE INDICATIVE OF A BLOWN FUSE. BETWEEN 159.0 SEC AND 159.1 SEC THE 400 CYCLE 1 PAHSE VOLTAGE, AND THE 2000 CYCLE 1 PHASE VOLTAGE ALL SHOWED DROPS OF FROM 10 TO 15 VOLTS, HOWEVER COMPLETE RECOVERY OCCURRED WITHIN 0.1 SEC BY THE TIME OF THE NEXT COMMUTATION CYCLE.

E. AGENA GUIDANCE AND FLIGHT CONTROL SYSTEM - OBJECTIVE NOT ACHIEVED
THE AGENA GUIDANCE SYSTEM RESPONDED PROPERLY TO A 5.45 SEC TIME-TO-FIRE CORRECTION AND A 2.97 SEC VELOCITY-TO-BE-GAINED CORRECTION COMMANDED BY THE GROUND GUIDANCE SYSTEM. VEHICLE ATTITUDE APPEARS TO HAVE BEEN CONTROLLED SATISFACTORIILY DURING THE INITIAL PART OF THE COAST PHASE. HOWEVER, DURING THE ULLAGE INTERVAL AND AT IGNITION THE TELEMETERED GYRO OUTPUTS INDICATED THAT THE GYROS WERE NOT RESPONDING TO THE NORMALLY EXPECTED VEHICLE ATTITUDE TRANSIENTS. SUBSEQUENT TO IGNITION THE ATTITUDE GYROS OUTPUTS SLOWLY DRIFTED OUT OF BAND WHILE LONGITUDIAL ACCELEROMETER DATA INDICATED THAT THE VEHICLE STARTED TUMBLING AT A HIGH RATE SHORTLY AFTER IGNITION. HYDRAULIC PRESSURE APPEARED TO BE NORMAL DURING THE THRUST INTERVAL. CONTROL GAS CONSUMPTION APPEARED NORMINAL UNTIL APPROXIMATELY 202 SEC WHEN THE SUPPLY PRESSURE

BEGAN TO DECAY RAPIDLY. THIS RAPID DECAY RESULTED FROM THE GAS JETS RESPONDING TO LARGE SIGNALS FROM THE IN-OPERATIVE GYROS.

EXAMINATION OF POWER MONITOR DATA INDICATED THAT THE AB PHASE EXCITATION TO THE GYRO WHEELS WAS LOST AT SEPARATION - APPARENTLY DUE TO A BLOWN FUSE. THIS LOSS OF EXCITATION TO THE GYRO WHEELS RESULTED IN THE DECAY OF WHEEL SPEED OVER THE SUBSEQUENT 30 SEC AFTER WHICH THE GYROS COULD NOT RESPOND PROPERLY TO VEHICLE ATTITUDE TRANSIENTS. THE LOSS OF CONTROL WAS COMPLETE AT ENGINE IGNITION AFTER WHICH THE VEHICLE BEGAN TO TUMBLE VIOLENTLY WHEN THE HYDRAULIC SERVOS RESPONDED TO THE OUTPUTS ASSUMED BY THE INOPERATIVE GYROS.

F. AGENA SPACE COMMUNICATIONS SYSTEM-OBJECTIVE APRTIALLY ACHIEVED

OPERATION OF THE ACQUISITION BEACON AND THE RADAR BEACON WAS SATISFACTORY VTS TRACKED THE ACQUISITION BEACON FROM LIFTOFF TO T PLUS 502 SEC AND THE RADAR BEACON FROM LIFTOFF TO T PLUS 480 SEC. AT T PLUS 502 SEC, THE TIME OF LINK 1 TELEMETRY FADE FOR VTS, ALL TELEMETRY CHANNELS WERE OPERATING, HOWEVER A SHARP 1 CPS CYCLE RATE BEGAN AT T PLUS 196 SEC AND LASTED TILL SIGNAL FADE. AGENA LINK 2 TELEMETRY SIGNAL WAS RECEIVED FROM LIFTOFF UNTIL PREMATURE LOSS AT SEPARATION. AT THIS TIME THE ORBITAL TIMER WAS SET AT STEP 25, IN THE RESET-ON POSITION, IN THE INCREASE MODE, AND ALTERNATE RE-ENTRY DISARM STATE. NO GROUNDS COMMANDS WERE SENT DURING THE ASCENT PHASE. SCP-4.

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FM 6595 AEROSPACE TEST WG VANDENBERG AFB CALIF
TO SSD LOSA CALIF
6594 AEROSPACE TEST WG SUNNYVALE CALIF
LMSC SUNNYVALE CALIF
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INFO ZEN/1STRATAD VANDENBERG AFB CALIF
6555 AEROSPACE TEST WING PATRICK AFB FLA
AFLC WRIGHT PATTERSON AFB OHIO
SBAMA NORTON AFB CALIF
ZEN/DET 1 AFLC VANDENBERG AFB CALIF
ZEN/CSD 1 WCMR VANDENBERG AFB CALIF
BT
~~S E C R E T~~ /FROM VWZD-13-1-S-S. SECTION II OF II.
8. AEROSPACE GROUND EQUIPMENT - OBJECTIVE ACHIEVED
BOOSTER AND ORBITAL STAGE CHECKOUT WAS SATISFACTORILY ACCOMPLISHED DURING THE PRE-LAUNCH COUNTDOWN BY THE AEROSPACE GROUND EQUIPMENT, HOWEVER THE FOLLOWING PROBLEMS WERE ENCOUNTERED:
/1/ THE AGENA AGE FUEL CHILLER VALVE FAILED TO OPEN ON COMMAND. EVALUATION INDICATED AN ELECTRICAL PLUG IN THE LINE WHICH SUPPLIES POWER TO THE VALVE HAD BECOME DISENGAGED.
/2/ WORK ON THE AGENA TANKING OPERATION WAS DELAYED FOR 25 MIN DUE TO RESOLUTION OF A MISSILE FLIGHT SAFETY PROBLEM.

/3/ A PIN SECURING A GEAR ON THE SAFT OF THE THOR AGE FUEL FLOW METER FAILED DURING THE THOR FUEL LOADING, IT WAS REPLACED WITH A SUBSTITUTE PIN.

4. DISCOVERER SYSTEM FACILITIES - OBJECTIVE ACHIEVED

THE AGENA LINK 1 TELEMETRY SIGNAL WAS RECEIVED AND RECORDED BY VTS FROM LIFTOFF TO T PLUS 502 SEC AND GOOD FLIGHT DATA WERE DERIVED FROM THE PERIOD FROM LIFTOFF TO T PLUS 490SEC. LINK 2 WAS PREMATURELY LOST AT T PLUS 159 SEC. THE VTS VERLORT RADAR PRODUCED GOOD ANALOG AND DIGITAL DATA RECORDS FOR THE PERIOD FROM LIFTOFF TO LOSS OF TRACK AT T PLUS 480 SEC. STATION COMMUNICATIONS DURING THE LAUNCH OPERATION WERE ADEQUATE.

5. PRE-LAUNCH COUNTDOWN

THE COUNTDOWN STARTED AT 0355 PST ON 13 JANUARY 1962 AND PROGRESSED TO LIFTOFF WITH THREE HOLDS TOTALING 2 HOURS 11 MINUTES.

/1/ HOLD NO. 1 WAS IMPOSED FROM 1050 /T-60MIN/ TO 1120 FOR RANGE CLEARANCE DUE TO TRAIN SCHEDULES.

/2/ HOLD NO. 2 WAS IMPOSED FROM 1213 /T-6 MIN 59 SEC/ TO 1332 DUE TO A MALFUNCTION IN THE THOR AGE FUEL FLOW METER. FLOW METER WAS REPAIRED, THE THOR DEFUELED, THE COUNTDOWN CLOCK RECYCLED TO T-15 MIN AND THE ENTIRE TERMINAL COUNTDOWN WAS REPEATED.

/3/ HOLD NO. 3 WAS IMPOSED AT T -1 MIN 37 SEC WHEN THE THOR TANK PRESSURE FAILED TO DECAY TO 3 PSIG DUE TO A CHILLDOWN OF THE VEHICLE

[redacted]

FROM THE PREVIOUS LOX LOADING. WHEN THE PRESSURE DROPPED BELOW 3 PSIG, ~~THE COUNTDOWN WAS RECYCLED AND PHASE V WAS REPEATED. THIS WAS~~ MOMENTARY HOLD.

6. PAD DAMAGE.

DAMAGE TO THE PAD EQUIPMENT AND FACILITIES WAS LESS THAN NORMAL SCP-4.

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14/0520Z JAN 62 VAFB

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